

cambridge technopole report

an overview of the UK's leading high-technology business cluster

www.cambridgetechnopole.org.uk



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Cambridge Technopole Group

The Cambridge Technopole Group is an informal network of business support organisations operating in the Greater Cambridge sub-region. The overall mission of the Group is to improve the range and quality of the business support services available in the sub-region, particularly for companies based on technology.

The more detailed objectives of the Group are fourfold:

1. To encourage the flow of information on new projects and initiatives between the members of the Group and to work together for the benefit of business customers.
2. To identify the key organisations involved in business support in the Greater Cambridge sub-region for the purposes of accurately signposting business customers.
3. To publicise and explain the origins and growth of the 'Cambridge Phenomenon' in order to attract and retain appropriate new businesses to the sub-region.
4. To identify gaps in the provision of support for businesses, and to lobby for resources to fill such gaps.

The Cambridge Technopole Group includes representatives from the following organisations:

- **Addenbrooke's Hospital** - www.addenbrookes.nhs.uk
- **Business Link in the East of England** - www.businesslinkeast.org.uk
- **Cambridgeshire Business Services** - www.c-b-s.org.uk
- **Cambridgeshire Chambers of Commerce & Industry** - www.cambridgeshirechamber.co.uk
- **Cambridgeshire Enterprise Services** - www.cambsenderprise.co.uk
- **Cambridge Network** - www.cambridgenetwork.co.uk
- **Cambridge Science Park** - www.cambridge-science-park.com
- **Colworth Science Park** – www.colworthpark.com
- **Eastern Region Biotechnology Initiative (ERBI)** – www.erbi.co.uk
- **East of England Development Agency (EEDA)** – www.eeda.org.uk
- **Great Eastern Investment Forum (GEIF)** – www.geif.co.uk
- **Greater Cambridge Partnership (GCP)** – www.gcp.uk.net
- **Health Enterprise East** - www.hee.org.uk
- **i10** – www.i10.org.uk
- **St. John's Innovation Centre (SJIC)** – www.stjohns.co.uk
- **The Babraham Institute** – www.babraham.ac.uk
- Various **University of Cambridge** departments and offices including:
 - Cambridge Enterprise – www.enterprise.cam.ac.uk
 - Corporate Liaison Programme – www.rsd.cam.ac.uk/companies
 - Institute for Manufacturing – www.ifm.eng.cam.ac.uk
 - Judge Business School - www.jbs.cam.ac.uk

Cambridge Technopole Report

The Cambridge Technopole Report provides an overview of the history, selected key organisations and their activities, and the challenges and opportunities facing the U.K.'s leading high technology business cluster. The report is authored by Walter Herriot (St. John's Innovation Centre Ltd.) and Tim Minshall (Technology Enterprise Group, University of Cambridge Institute for Manufacturing), and is updated annually. The views presented in this report are those of the authors and do not necessarily represent those of the Cambridge Technopole Group as a whole.

This document is not a directory of businesses and support organisations in Greater Cambridge. Directories of such organisations in the sub-region are provided via various websites including the Cambridge Network (www.cambridgenetwork.co.uk) and the Cambridgeshire Chambers of Commerce (www.cambridgeshirechamber.co.uk).

This report – and associated documents and references – can be downloaded from:

www.cambridgetechnopole.org.uk

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Contents

- 1. The context 1
- 2. Growth of the Technopole 1
- 3. Challenges and opportunities 2
- 4. How does Cambridge compare?..... 3
- 5. What are the key organisations within the Technopole? 5
 - Universities 5
 - Networks and conferences 6
 - Science parks and incubators 8
 - Venture Capital 9
 - Business angels and investor networks 10
 - Support for new and growing ventures 10
 - Professional service providers 12
 - Technology providers 13
 - Policy and strategy 14
- 6. Concluding comments 15
- Appendix: Selected milestones in the evolution of the Cambridge Technopole 16

References: If publicly available, the documents given in the footnotes in this report can be downloaded from www.cambridgetechnopole.org.uk.

1. The context

The ‘Cambridge Technopole’ is a geographic area of intense high-technology innovation activity encompassing the City of Cambridge at its heart and the sub-regional Greater Cambridge hinterland of approximately 25 miles radius. It sits in the wider region of the East of England, one of the fastest growing regions in the UK. Much of this growth has been fuelled by the dynamism of the Cambridge Technopole area.

| | | |
|--|--|--|
| Working population: | 360,000 ¹ | |
| Geographic area: | 25 mile radius centred on Cambridge | |
| Number of high-tech firms: | Approximately 1,400 ² | |
| Employment in high-tech firms: | Approximately 43,000 | |
| Number of universities: | 3 | |
| Key technology sectors include: | Information technology (hardware and software), mobile telecommunications, biotechnology, electronics (inc. plasronics), instrumentation, nanotechnology, inkjet printing. | |

2. Growth of the Technopole

The development of the Cambridge Technopole has been very much a ‘bottom-up’ initiative. In 1978 there were around 20 high-tech companies in the area. One of the leading UK clearing banks – Barclays plc – recognised that these companies could form the heart of a ‘mini-cluster’, helped form the Cambridge Computer Group and made one of the bank’s employees available to assist start-ups with business advice and help in raising finance.

By 1985 the number of high-technology companies had increased to around 360 when the significance of what was happening in Cambridge was identified by the publication of the much-cited ‘Cambridge Phenomenon’ report³. This report gave an overview of the evolution of the high-technology industry in Cambridge. Since then, the Cambridge Technopole has grown significantly and is now home to over 1,400 high technology ventures employing around 43,000 people.

The collapse of the Internet-fuelled speculative bubble in 2000 slowed the growth of the Technopole but the period 2004-2007 saw a recovery in the number and size of investments into Cambridge companies. This has been driven by increased investor confidence resulting from factors including the number of IPOs (including CSR, Bango, AbCam and Amino Technologies), coupled with increased high value M&A activity (see Table 1). Examples of recent significant equity investments have included Light Blue Optics raising US\$26m, Cachelogic raising US\$20m, and Plastic Logic raising US\$100m to move to volume production of its polymer electronics.

1 From Greater Cambridge Partnership (www.gcp.uk.net/greater-cambridge.php).
 2 Depending on the definition used, the number of high tech companies in Greater Cambridge varies between 1000 and 3,500. The figure of 1,400 is drawn from the Greater Cambridge Annual Profile 2007 (www.gcp.uk.net/downloads/G_C_Profile_07.pdf). Alternative surveys of Cambridge Technopole companies can be found at www.cambridgetechnopole.org.uk.
 3 Segal, Quince & Partners (1985), The Cambridge Phenomenon: The Growth of High Technology Industry in a University Town.

Table 1: Recent trade sales with deal value >£100m⁴

| Company | Acquirer | Amount raised (£m) |
|-------------------------------|-------------------|--------------------|
| KuDOS Pharmaceuticals | AstraZeneca | 121 |
| Domantis | GlaxoSmithKline | 230 |
| Cambridge Antibody Technology | AstraZeneca | 642 |
| Cambridge Display Technology | Sumitomo Chemical | 142 |
| Arakis | Sosei | 107 |

3. Challenges and opportunities

Should the Technopole be part of a 'supercluster'?

The Cambridge Technopole has become one of the most successful high technology business clusters in Europe. However, it is unlikely that the Technopole will attract or create individual businesses employing tens of thousands of people locally if only because the physical infrastructure is not in place nor could be made available in time frames acceptable to rapidly growing businesses. Cluster companies have shown that they can grow substantially over time. This is evidenced by the existence of only one publicly quoted company 1990 compared to 70 in 2006⁵.

The question has recently been raised as to whether the Technopole should stand alone or now be considered both strategically and operationally as part of a Greater South East 'supercluster' involving London and Oxford⁶. This would allow Cambridge to be recognised for what it is – predominantly a 'hotbed' of start up activity involving businesses that are commercially exploiting scientific knowledge – but with much stronger links to the substantial financial, marketing and manufacturing capabilities from across the South East of the UK. Unlike the Cambridge Technopole when considered in isolation, this 'supercluster' can begin to warrant comparison with major international clusters in terms of geographic size and population.

What is the role of public support?

In recent years there has been public funding provided for 'soft' infrastructure development within the Technopole. Examples include the funding for a range of specific programmes within the Technopole to assist early stage businesses. One of the most successful of these has been the 'Enterprise Hubs' programme⁷, funded by the East of England Development Agency (EEDA). Enterprise Hubs are a series of linked initiatives that (1) encourage the development of networking groups in the region's key knowledge-based sectors and clusters; (2) support the development of incubators, innovation centres and science parks; (3) ensure the delivery of leading-edge innovation support; and (4) support innovative businesses as they seek access to finance to accelerate growth. Within the Technopole area, Enterprise Hubs are run by St John's Innovation Centre, Health Enterprise East and the Babraham Institute.

It is recognised that more needs to be done to improve business support and financing if the Cambridge Technopole is to retain its resilience and achieve its potential. For example:

- There is evidence that an additional type of funding mechanism is necessary to support Technopole companies⁸. Such funding is needed for early-stage companies whose potential markets are too niche to attract traditional equity investors as perceived returns are too small. A mezzanine type product would assist such companies to grow rapidly and sustainably.
- The public sector, through procurement, could act as a 'venturesome consumer' of emerging technologies⁹. A key policy instrument used in the U.S. to support such activity is the Small Business

4 Library House (2007). Looking Inwards, Reaching Outwards: The Cambridge Cluster Report 2007.

5 Library House (2006). The Supercluster Question: The Cambridge Cluster Report 2006.

6 EEDA/LDA/SEEDA (2007). The UK's engine for growth and prosperity: A case for targeted investment in the Greater South East.

7 www.eeda.org.uk/files/enterprise_hubs.pdf

8 Hornby, Gill and Herriot (2006). Bank Support for Early Stage Technology Businesses.

9 Bhidé, A. (2006). Venturesome Consumption, Innovation and Globalization.

Innovation Research (SBIR) Program. The implementation of a similar programme in the UK (as argued by David Connell¹⁰) could assist the growth of Technopole businesses.

- The development of the East Forum¹¹ as a business incubator for the University of Cambridge – funded by both public (EEDA) and private (Hauser Raspe Foundation) sources – is an example of an exciting new entrepreneurship-related initiative and is due to open in 2009. However, the University of Cambridge needs on-going public support if it is to enhance and integrate its diverse range of commercialisation and entrepreneurship activities such as the business planning competitions, i-Teams programme, entrepreneurship training programmes, and the provision of general guidance to staff, graduates and undergraduates who are endeavouring to establish businesses.
- Entrepreneurship needs to be encouraged throughout the Technopole. For example, there should be more interactions with schools, and the Anglia Ruskin University initiative to establish an undergraduate course on entrepreneurship¹² should be fully supported.

But it is not only the soft 'infrastructure' that requires improvement. Affordable housing is a real issue and the development of new town of Northstowe¹³ in the context of the Technopole is an area where sympathetic planning and design will be required. Major improvements to the A14 dual carriageway need to be started sooner rather than later if Cambridge is continue to be perceived nationally and internationally as a 'good place to do business'.

How is the Technopole performing?

Recent reports have presented conflicting views on the current performance of the Technopole. While some reports have presented data which indicate a slowing or plateauing of growth, or even a decline, other indicators seem to show a buoyant economy. With the high profile of the Cambridge Technopole in policy and investment arenas, a clear and comprehensive picture of the performance the Technopole is needed. Building on the work of the recently published Greater Cambridge Annual Profile¹⁴, a consolidated 'dashboard' of a range of comparable performance indicators would allow consideration of both the Technopole's absolute and relative performance, nationally and internationally. This would help inform analysis of the needs of the Technopole if it is to continue to be a significant generator of economic value for the UK, and what lessons can be drawn from, and shared with, other regions. Without this there is a risk that selected performance indicators will be over-emphasised, and this may either inappropriately boost or retard investor and policymaker confidence.

4. How does Cambridge compare?

Attempts are often made to compare the Cambridge Technopole with other major clusters such as Silicon Valley (as shown in Table 2). Making such a comparison, in the words of Technopole entrepreneur Mike Lynch (CEO of Autonomy), is like "comparing a Seagull with a Boeing 747". Walter Herriot (MD of St John's Innovation Centre) has argued that the analogy is perhaps more accurately like comparing "a Kingfisher with a Vulture".

10 Connell, D. (2004). Exploiting the UK's Science and Technology Base: How to fill a gaping hole in UK Government policy.

11 www-building.arct.cam.ac.uk/westc/eforum/eforum.html

12 www.anglia.ac.uk/ruskin/en/home/news/new_management_course.html

13 www.gallagherstates.co.uk/cambridgeshire.php

14 www.gcp.uk.net/downloads/G_C_Profile_07.pdf

Table 2: Cambridge Technopole and selected comparator regions

| | Approximate employment in high technology | Approximate amount of VC invested in 2006 (US\$m) |
|----------------|---|---|
| Cambridge | 43,000 | 260 |
| Silicon Valley | 336,300 | 3,600 |
| Israel | 238,000 | 1,622 |
| Bangalore | 170,000 | 1,525 |
| Beijing | 300,000 | 745 |

Estimates compiled from: www.pwcmoneytree.com, www.clusterobservatory.eu, www.gcp.uk.net, www.jointventure.org, www.bjkw.gov.cn, www.zero2ipo.com.hk, www.cbs.gov.il, www.indiavca.org, www.ivc-online.com.

As shown in Table 2, Cambridge has a much smaller number of people working in high technology firms than other internationally recognised clusters but 'punches above its weight'. Illustrations of Technopole strengths include the following:

- The Cambridge Technopole is one of the top four regions in Europe in terms of total institutional investment into innovative start-ups, is #1 in Europe in terms of investment per capita, and attracted 18% of all venture investment in the UK in H1 2007¹⁵.
- Spin-outs from the University of Cambridge have received more venture capital investment than any other UK university¹⁶.
- Numerous significant scientific discoveries and inventions have been made at the University of Cambridge. This is reflected in the fact that the University has more Nobel Laureates than any other university in the world – 82 in total – and is ranked as one of the top four universities world-wide¹⁷.
- The Cambridge Technopole is one of a handful of regions in Europe to be consistently ranked by the European Commission as 'excellent for its support of innovative start-ups'¹⁸.
- University of Cambridge people and technology have been at the heart of over 300 new high-tech ventures in the past 10 years¹⁹, many of which now lead their industry sectors. Examples include:
 - **Abcam** – "the largest catalogue of the best antibodies in the world."
 - **ARM** – the leading provider of RISC microprocessor solutions.
 - **Astex Therapeutics** – developer of molecularly-targeted drugs for oncology.
 - **Autonomy** – market leader in infrastructure software for the enterprise.
 - **Light Blue Optics** - developing holographic laser projection technology.
 - **nCipher** - leading developer of Internet security products.
 - **Owlstone** – commercialising nanofabricated chemical detection systems.
 - **Plastic Logic** – commercialising technology for inkjet printing of plastic electronics.
- Cambridge is also the heart of a vibrant international technology consultancy cluster that applies leading scientific and technological know-how to commercial needs. This consultancy cluster has played a very significant role in the growth of new industry sectors such industrial inkjet printing, and a range of applications of wireless information and communication technologies.

15 Library House (2007). Looking Inwards, Reaching Outwards: The Cambridge Cluster Report 2007.

16 Sainsbury, D. (2007). The Race to the Top: A Review of Government's Science and Innovation Policies.

17 <http://ed.sjtu.edu.cn/ranking.htm>

18 See www.cordis.lu/paxis

19 Information on University of Cambridge spin-outs can be found at www.enterprise.cam.ac.uk and a report describing the spin-out and start-up activity around the University can be downloaded from the 'Reports' section of the Technopole website: www.cambridgetechnopole.org.uk.

5. What are the key organisations within the Technopole?

It has been suggested that the success of the Cambridge Technopole is not so much based upon what the individual organisations do, but the way in which they do it. This has been summed up as:

- **Community** – in Cambridge there is a sense of being part of something significant and special that is making a real impact on the world. The Cambridge Network's strap line of '*Cambridge ideas change the world*' perhaps best sums this up.
- **Collaboration** – because of the sense of community, organisations and individuals are typically very willing to help each other. This is reflected in the high level of engagement of the business community in enterprise education activities throughout Cambridge.
- **Constructive chaos** – there is no one group that 'organises' Cambridge. New initiatives are continuously springing up – some succeed and some fail. This may be perceived as inefficient, but does result in a highly entrepreneurial environment.

In the following sections, examples of some of the key initiatives and organisations that reflect the character of the Cambridge Technopole are presented.

Universities

There are three universities with significant activities within the Cambridge Technopole area.

| | | |
|--------------------------|---|--|
| University of Cambridge | University of Cambridge is one of the largest in the U.K. Its reputation for outstanding academic achievement is recognised world-wide. It has over 18,000 fulltime students. | www.cam.ac.uk |
| Anglia Ruskin University | ARU has some 28,000 students who are currently studying ARU's two main campuses in Chelmsford or Cambridge or at one of the colleges that form ARU's Regional University Partnership. | www.anglia.ac.uk |
| Open University (OU) | Open University is the largest provider of undergraduate part-time education in the East of England supporting over 17,000 students. | www.open.ac.uk |

Networks and conferences

Cambridge now hosts a number of international entrepreneurship and innovation-related events that bring together the private, public and educational sectors.

To help address the high level of demand for visits and delegations to the Technopole, an International Relations Manager has recently been appointed²⁰.

| | | |
|--|---|---|
| <p>Cambridge Corporate Gateway (April and October)</p> | <p>Provides companies from around the globe with the opportunity to access both high-technology cluster and University research.</p> | <p>www.cambridgenetwork.co.uk/corporategateway</p> |
| <p>Cambridge Enterprise Conference (September)</p> | <p>Since 1997, providing a community for global technology entrepreneurship practitioners to discuss & debate enterprise. 9th conference will be in September 2008.</p> | <p>www.cambridgeenterpriseconference.co.uk</p> |
| <p>Cambridge International Manufacturing Symposium (September)</p> | <p>A forum for the exploration of international manufacturing issues. The two day event combines a focus on current industrial issues, best practice and the development and application of research.</p> | <p>www.ifm.eng.cam.ac.uk/cim</p> |
| <p>Cambridge Summer Forum (June)</p> | <p>A modular programme offering best practice and network with others from around the world in the fields of innovation centres and science parks, university commercialisation, networking, entrepreneurship training and early-stage finance.</p> | <p>www.cambridgenetwork.co.uk/summerforum</p> |
| <p>Cambridge Technology Management Symposium (September)</p> | <p>First run in 1995, this event is aimed at senior technology and innovation managers from companies of all sizes. It draws on leading practice and research to address the current key issues.</p> | <p>www.ifm.eng.cam.ac.uk/ctm</p> |
| <p>ERBI Annual Cambridge BioPartnering Exchange (May)</p> | <p>Started 1999 - "draws upon companies and research in the Cambridge area to demonstrate the innovation and entrepreneurship that underpins the most mature biotech cluster in Europe."</p> | <p>www.erbiconference.co.uk</p> |
| <p>High Value Manufacture Cambridge Conference (April/November)</p> | <p>A forum for discussion of issues relating to high value manufacturing in the East of England.</p> | <p>www.cambridgeinvestmentresearch.com</p> |
| <p>Horizon Seminars (3-4 times per year)</p> | <p>Provides participants with a first look at new developments in the most exciting areas of science and technology at Cambridge. The events bring together experts from academia and industry.</p> | <p>www.rsd.cam.ac.uk/events/horizon</p> |
| <p>Silicon Valley Comes to Cambridge (November)</p> | <p>An initiative to bring together leading Silicon Valley serial entrepreneurs and investors for discussion and debate on how and why they have created and funded today's most groundbreaking "disruptive" technologies.</p> | <p>www.jbs.cam.ac.uk</p> |

²⁰ www.gcp.uk.net/international.php

There are numerous networking organisations whose activities are targeted at the needs of particular interest groups within the Technopole.

| | | |
|---|---|--|
| Cambridgeshire Chambers of Commerce | Cambridgeshire Chambers of Commerce exist to connect people with people, business with business and to promote, represent and expand the business interests of its members. | www.cambridgeshirechamber.co.uk |
| Cambridge Enterprise and Technology Club (CETC) | The Cambridge Enterprise & Technology Club provides a networking forum for business people, academics, technologists and service providers, together with a unique opportunity to learn about cutting edge technologies. | www.cetc.info |
| Cambridge High-tech Association of Small Enterprises (CHASE) | CHASE is an association of small businesses in the Cambridge area working in, or associated with, high technology. Since its foundation in 1987, CHASE has retained its focus on technology start-ups and small enterprises, particularly catering for the needs of those with fewer than 10 employees. | www.chase.org.uk |
| Cambridge Network (CN) | CN enables its members to work together & leverage their collective resources in new ways for the benefit of technology-enabled enterprise in the Cambridge sub-region. Founded in 1998, CN has more than 1,100 members across business, government & academe. | www.cambridgenetwork.co.uk |
| Eastern Region Biotechnology Initiative (ERBI) | The Eastern Region Biotechnology Initiative was established in 1997 as a networking and communications organisation to enhance the growth and development of biotechnology in Cambridge and the East of England. | www.erbi.co.uk |
| Enterprise Link | Enterprise Link offers support to early-stage technology-based businesses. Assists the growth of companies through networking, & providing first-level advice, signposting, & contacts. Launched in 1999 - now has over 600 members. | www.enterprise-link.co.uk |
| Cambridge University Institute for Manufacturing (IFM) | IfM helps manufacturers to raise their manufacturing skill base, developing innovative tools and techniques, & transferring know-how to industry. IfM provides: short courses; collaborative research & industrial problem solving; best practice & new technique deployment services; business networking. | www.ifm.eng.cam.ac.uk |
| The Learning Collaboration (TLC) | An organisation formed by HR Directors of local firms under the auspices of the Cambridge Network to help companies to access professional training and development. | www.thelearningcollaboration.com |

Science parks and incubators

The Cambridge Technopole is home to a range of specialist accommodation for knowledge-intensive and early stage ventures²¹. This breadth of provision is illustrated through the following examples.

| | | |
|------------------------------|--|--|
| Babraham Bioincubator | Started in 1998 - combined office and laboratory space for start-up and early stage ventures. | www.babraham.co.uk |
| Cambridge Research Park | Provides office and R&D space in a 45 hectare low density park setting. Located 5 miles north of Cambridge. | www.cambridgeresearchpark.com |
| Cambridge Science Park | Started in 1970 - Premises for over 90 science-based firms from small start-ups and spin-outs to subsidiaries of multinational corporations. | www.cambridgesciencepark.co.uk |
| Chesterford Research Park | 250 acre low density scheme to provide accommodation for science and technology based companies of all sizes. | www.chesterfordresearchpark.com |
| Colworth Science Park | Office and laboratory space close to Bedford providing accommodation for a range of company sizes supported by specialist scientific services. | www.colworthpark.com |
| Granta Park | Research & development park providing 600,000 sq ft of laboratory and office space, situated 7 miles south east of Cambridge. | www.grantapark.co.uk |
| Melbourn Science Park | 200,000 sq ft of R&D and office space located 9 miles south of Cambridge. Owned by The Technology Partnership Group. | www.melbournsciencepark.com |
| St. John's Innovation Centre | Started in 1987 - Provides business support and accommodation for around 60 early stage knowledge based companies. | www.stjohns.co.uk |

These organisations typically perform functions beyond what is assumed to be their core business. The example of St. John's Innovation Centre shown below illustrates this particularly clearly.

| | |
|-----------------------------------|--|
| St. John's Innovation Centre Ltd. | |
| Physical Incubator | 'Home' for up to 60 high-technology related businesses. |
| Virtual Incubator | Hands-on support for 500+ non-tenant nascent ventures. |
| Rent-an-address | Provides mail and telephone services to 240+ non-tenant ventures. |
| High Growth Start-up Services | Supports local companies with business plan development and training in conjunction with University of Cambridge Enterprise, funded by Cambridgeshire Business Services. |
| Enterprise Link | Networking, events and advice for +600 early stage technology ventures. |
| Innovation Relay Centre (IRC) | Gateway to extensive technology & business network spanning 30 countries across Europe – www.innovation-east.co.uk . Ranked #1 IRC in Europe in 2005. |

²¹ For more information on R&D and business accommodation, see www.gcp.uk.net/int-property.php

Venture Capital²²

In addition to strong investment activity in Cambridge from major national and international funds, Cambridge is home to the largest concentration of seed and venture capital funding in the UK outside London. Examples of funds focusing on high-tech and biotech with an operating base in Cambridge include the following.

| Fund | Fund(s) size | Investment range | | Investment areas | URL |
|---|-----------------|------------------|---------------|--|--|
| | | From | To | | |
| 3i | £7bn (globally) | £2m | £150m | All business sectors. | www.3i.com |
| Amadeus Capital Partners | £460m | - | £16m | Communications, networking & computing hardware & software, media, e-commerce, medical, clean energy technologies. | www.amadeuscapital.com |
| Avlar BioVentures | £64m | £25k | £4.3m | Biotechnology, Life Sciences, Medical/health related. | www.avlar.com |
| Cambridge Enterprise Seed Funds | £4m | £10k | £250k | University of Cambridge spin-outs. | www.challengefund.cam.ac.uk |
| Cambridge Gateway Fund | £35m | £1m | £5m | IT, telecommunications or life science ventures. | www.cambridgegateway.com |
| Create Partners (East of England Regional Venture Capital Fund) | £20m | £100k | £2m | All sectors, high growth potential companies in East of England. | www.createpartners.com |
| DFJ Esprit (including Prelude Trust) | £285m | £250k | £12.5m | High growth potential ventures in technology, media, telecoms and healthcare | www.dfjesprit.com |
| East of England Co-Investment Fund | £3.6m | £25k | £250k | Sector and stage agnostic but company must be beneficial to Objective 2 economies in region. | www.investeast.co.uk |
| ET Capital | £13m | £20k | £750k | High-growth companies exploiting innovative application of technology. | www.etcapital.com |
| GEIF Ventures | £5m | - | £100k (£400k) | Co-invest into early growth businesses with angels who are members of GEIF. | www.geifventures.co.uk |
| IQ Capital | £35m | £100k | £3m | Seed, early stage and expansion funding for technology ventures. | www.iqcapital.co.uk |
| TTP Venture Managers | £35m | £50k | £3m | Early stage science and technology companies. | www.ttpventures.com |

22 Data here is drawn from the British Venture Capital Association website (www.bvca.co.uk), and individual funds' own websites.

Business angels and investor networks

| | | |
|--------------------------------|---|--|
| Cambridge Angels | A business angel group set up in 2001 to accelerate early-stage investments in Cambridge start-ups. | www.cambridgeangels.net |
| Cambridge Capital Group | Private equity syndicate of angel investors offering funding for early stage technology based companies. | www.cambridgecapitalgroup.co.uk |
| 'Choir of Angels' | "An informal group, investing in businesses we can understand, so we can contribute more than money." | Contact via: cсаunders@compuserve.com |
| Great Eastern Investment Forum | Business angel network that has helped over 70 early stage companies raise investment. Linked to £5 million co-investment fund, GEIF Ventures. | www.geif.co.uk |
| Library House | A research and data services company that was founded to provide greater transparency and access to innovation based companies. | www.libraryhouse.net |
| The Gauntlet | A web-based service which provides entrepreneurs with information on "what it takes to get investors to invest". | www.the-gauntlet.com |
| Venture Navigator | An online service designed to help start-ups and small businesses improve their chances of success. Services provided include on-line assessment of investment readiness. | www.venturenavigator.co.uk |

Support for new and growing ventures

In addition to the networking groups, incubators and investors shown above, a number of agencies deliver an extensive range of support for entrepreneurs and established businesses in the Cambridge Technopole. Services are often free of charge or subsidised substantially from public funds.

| | | |
|--------------------------------------|--|--|
| Business Link in the East of England | Business Link is a government-funded service designed to promote enterprise. Its aim is to provide relevant services from the broadest range of public and private sector business support services at a national, regional and local level. | www.businesslinkeast.org.uk |
| Cambridgeshire Business Services | Cambridgeshire Business Services (CBS) is part of an established group of companies that delivers services for individuals, businesses and public sector organisations. | www.c-b-s.org.uk |
| Cambridgeshire Chambers of Commerce | Exists to connect people with people, business with business and to promote, represent and expand the business interests of its members. | www.cambridgeshirechamber.co.uk |
| Cambridge Enterprise Services | Provision of one-to-one advice sessions, access to a range of information resources, networking opportunities, and a comprehensive toolkit for business planning | www.cambsenterprise.co.uk |

Organisations within the University of Cambridge have also developed specific competence to support start-up, growing and mature ventures. To help the flow of information between these organisations, the Enterprise Network has been established (www.enterprisenetwork.group.cam.ac.uk). Details on a sample of members of the Enterprise Network are given below.

| | | |
|---|--|--|
| Biology in Business (BiB) | A 1,700 member strong Cambridge based non-profit organization that bridges academic and commercial life science to promote career development and technology transfer through events, online resources and networking opportunities. | www.biologyinbusiness.org |
| Cambridge Enterprise (CE) | Cambridge Enterprise exists to help University of Cambridge inventors, innovators and entrepreneurs make their ideas and concepts more commercially successful for the benefit of society, the UK economy, the inventors and the University. | www.enterprise.cam.ac.uk |
| Cambridge University Entrepreneurs (CUE) | CUE organises the most successful student run business planning and creation competitions in Europe. Since 1999, CUE has had over 450 entries and has awarded over £320,000 in grants to 41 business ideas. These companies have raised more than £28m further funding and are currently valued at more than £42m. | www.cue.org.uk |
| Cambridge University Technology and Enterprise Club (CUTEC) | CUTEC organises a series of events and activities that are designed to enhance entrepreneurship amongst members of the University. These allow the sharing of experiences from technology investment and entrepreneurship with both the university and business communities. | www.cutec.org |
| Centre for Entrepreneurial Learning (CfEL) | CfEL delivers a range of educational activities on the practise of entrepreneurship, to inspire and build skills and 'spread the spirit of enterprise' within the University of Cambridge and beyond. Key programmes include Enterprise Tuesday and the Ignite Programme. | www.cfel.jbs.cam.ac.uk |
| Institute for Manufacturing (IfM) | IfM works closely with companies in the areas of strategy and performance, technology management, international manufacturing and supply networks through research, education and direct support. | www.ifm.eng.cam.ac.uk |
| i-teams | i-Teams allows entrepreneurial post-graduate students to work with real inventions to determine the best route for their commercialization, and present the results at CUTEC's annual Tech Ventures Conference. | www.itemsonline.org |
| Judge Business School (JBS) | Through its Cambridge Venture Projects, Global Consulting Projects and MOTI projects, JBS encourages MBAs, graduates and undergraduates to collaborate with local companies on specific projects. | www.jbs.cam.ac.uk |
| Research Services Division (RSD) | Helps companies of all sizes, from regional start-ups to multinationals, identify the most appropriate way to work with the University of Cambridge, in order to build enduring and sustainable relationships for commercial competitive advantage. | www.rsd.cam.ac.uk/companies |

There is now a significant level of interaction between local start-ups and the University of Cambridge through the numerous student in-company projects organised via various departments. Information for potential host companies is given at www.ifm.eng.cam.ac.uk/studentprojects.

Professional service providers

Entrepreneurs in Cambridge have access to a full range of support from small, medium and large professional service providers. The table below shows some of the major organisations operating in the legal, banking and accountancy areas that have offices in Cambridge. A number of these professional service providers have developed charging mechanisms appropriate for the needs of early stage technology ventures (e.g., deferred payments, reduced payments) and recruited specialist staff to deal with the particular needs of technology businesses (e.g., banks with specialist technology business managers).

| | | |
|------------------|---|--|
| Eversheds | Full range of legal services for businesses | www.eversheds.com |
| Hewitsons | | www.hewitsons.com |
| Mills & Reeve | | www.mills-reeve.com |
| Taylor Vinters | | www.taylorvinters.co.uk |
| Taylor Wessing | | www.taylorwessing.com |
| BDO Stoy Hayward | Full range of accountancy services for businesses | www.bdo.co.uk |
| Deloitte | | www.deloitte.co.uk |
| Ernst & Young | | www.ey.com/uk |
| Grant Thornton | | www.grant-thornton.co.uk |
| KPMG | | www.kpmg.co.uk |
| PWC | | www.pwcglobal.com/uk |
| Barclays | Full range of banking services for business | www.smallbusiness.barclays.co.uk |
| HSBC | | www.ukbusiness.hsbc.com |
| LloydsTSB | | www.success4business.com |
| NatWest / RBS | | www.natwest.co.uk/businessedge |

Support is also available from a diversity of specialist private sector organisations providing services including investment readiness, PR, technical and market due diligence, IPR and mentoring, reflecting the growing sophistication of needs of new and growing ventures in the Cambridge area. Information on these and other support service providers can be found at www.cambridgenetwork.co.uk and www.cambridgeshirechamber.co.uk.

It is also interesting to note the arrival and development of 'specialist' service providers that reflect the evolution of needs within the Technopole – e.g., **NW Brown Group**²³ (providing a range of financial services to private and corporate clients) has been in Cambridge since 1974; **Coutts & Co.**²⁴ (the specialist private banking arm of the Royal Bank of Scotland Group) opened offices in Cambridge in 2001; and **Kleinwort Benson Private Bank**²⁵ announced their intention to set up in Cambridge in 2008.

There is now also extensive provision of advice and support on intellectual property matters available in Cambridge – see www.cipa.org.uk and search for 'Cambridge'.

23 www.nwbrown.co.uk

24 www.coutts.com

25 www.kbpb.co.uk

Technology providers

A critical role has been played in the growth of the Cambridge Technopole by those organisations whose function can be viewed as 'technology provider'. These can be divided into three groups: technology consultants; higher education research institutions (including embedded laboratories); and corporate R&D organisations (both Cambridge start-ups and 'incomers'). These organisations typically do much more than just their 'core' research function. For example, the technology consultants now actively exploit the competence they have developed through their consulting work through the formation of new business ventures (e.g., Cambridge Consultants have spun out a series of very successful ventures – such as Domino Printing Sciences – built around their expertise in industrial inkjet printing technologies). Corporate R&D labs also spin-out new ventures (e.g., Teraview from Toshiba Research (Europe)). The University of Cambridge has been the origin of over 300 new ventures based around University people and research²⁶, and this may be linked to access to the commercial world provided by the presence of embedded corporate R&D labs within the University.

It is also interesting to note the emergence of new large scale academic-business collaborative initiatives within the Technopole. One example is the Cambridge Knowledge Integration Centre (CIKC) which brings together research and commercialisation activities on molecular and macromolecular materials²⁷.

| Examples of Technology Consultants | | |
|---|---|--|
| TTP Group | Technology consulting, product development and new venture incubation. | www.ttp.com |
| Cambridge Consultants | | www.cambridgeconsultants.com |
| Sagentia | | www.sagentia.com |
| PA Technology | | www.paconsulting.com |
| Examples of higher education research institutions and embedded laboratories | | |
| University of Cambridge | The science and technology departments of the University carry out research across all major disciplines. | www.cam.ac.uk |
| Microsoft Research | Operates in partnership with the Computer Laboratory. Focuses on security, information retrieval, OS & networking. | www.research.microsoft.com/aboutmsr/labs/cambridge |
| Nokia Research Centre (NRC) | A collaboration with the Nanoscience Centre and Electrical Division of the Engineering Department on projects that are centred on nanotechnology. | research.nokia.com |
| Unilever Centre for Molecular Informatics | Inter-disciplinary research integrating chemical, biological & materials sciences through molecular informatics. | www-ucc.ch.cam.ac.uk |
| Examples of corporate R&D organisations (Cambridge start-ups and incomers) | | |
| ARM | Involved in joint research and development programs with universities, companies and other organizations. | www.arm.com |
| Kodak European Research | Focuses on key technologies in the area of display, commercial printing and health imaging. | www.kodak.com/go/cambridge |
| Toshiba Research (Europe) | Undertakes basic research into quantum semiconductor physics and related topics. | www.toshiba-europe.com/research |

²⁶ Hiscocks, P. (2005). Performance of New Business Ventures from the University of Cambridge.

²⁷ www-g.eng.cam.ac.uk/CIKC

Policy and strategy

As noted at the start of this report, the success of the Cambridge Technopole has been based largely upon 'bottom up' initiatives. At various times during the development of the Technopole the need for a single unitary authority has been raised. The creation of such an authority would, it has been suggested, provide a means to develop and implement clear strategies for the growth of the Technopole, and would overcome the perceived inefficiencies resulting from dividing decision making between multiple regional and local bodies. Such plans have not come to fruition, but a recent national review²⁸ has led to a streamlining of economic development activities that have the potential to enhance the growth of the Technopole.

Currently, the East of England Development Agency (EEDA²⁹) is responsible for the development and implementation of strategies for the economic development of the East of England. Finance for EEDA comes from a 'Single Programme' combining funds from central government departments³⁰. EEDA receives funding from this Single Programme which is then channelled to regional activities including support for Business Link in the East of England, the Greater Cambridge Partnership and East of England International. The Greater Cambridge Partnership (GCP³¹) manages EEDA's activities and programmes on a sub-regional basis and acts as an umbrella organisation for public and private sector interests in the Technopole.

The national review of economic development activities is now leading to an increasingly strategic rather than operational / delivery role for the regional development agencies (RDAs), with more power to be given to the local authorities and economic partnerships. For the Technopole, this should result in a strengthening of the role of the Greater Cambridge Partnership.

Other key publicly funded initiatives with relevance for the governance of the Cambridge Technopole include the following.

| | | |
|--|--|--|
| District Councils | Responsible for public services within the five districts of Cambridgeshire. | www.cambridgeshire.gov.uk/council/government/district.htm |
| Cambridgeshire County Council | Responsible for public services in the county of Cambridgeshire. | www.cambridgeshire.gov.uk |
| East of England International | Responsible for attracting and supporting overseas investment into the region. | www.eeia.com |
| Government Office for the East of England (GO-East) | Represents central government in Cambridge. | www.go-east.gov.uk |

Publicly funded support for Technopole firms is delivered directly by public agencies (e.g., by Business Link in the East of England) or indirectly via specific programmes run by private sector partners (e.g., the Enterprise Hub Programme, delivered in the Technopole by St John's Innovation Centre, Health Enterprise East, and the Babraham Institute).

28 HM Treasury/BERR (2007). Review of sub-national economic development and regeneration.

29 www.eeda.org.uk

30 Contributing departments are BERR, CLG, DfES, DEFRA and DCMS.

31 www.gcp.uk.net

Increasing emphasis is now being placed on linkages between initiatives and organisations. One example is the Science and Industry Council (SIC) set up by EEDA in 2004. The role of the SIC is:

- To bring together the expertise of industry, higher education institutions and research institutes to realise effective communication between key regional players.
- To add value to existing mechanisms to support innovation by influencing the relationships among academic, research and business communities in the areas of research, knowledge and technology transfer, innovation, training and skills.

A major challenge for the SIC – whose members are volunteers from the public, private and academic sectors – is to ensure that its recommendations on how to support innovation are taken forward by EEDA.

Changes at the national level are also presenting opportunities and challenges for those responsible for policy and strategy within the Technopole. For example, the national Technology Strategy Board (TSB³²) – established as an executive Non-Departmental Public Body in July 2007 – aims “to stimulate innovation in those areas which offer the greatest scope for boosting UK growth and productivity”. It has a substantial budget to achieve its aim, but it is not yet clear how the strategy of the TSB will be integrated with the innovation-related activities of EEDA and the GCP, and hence how the Technopole will be positioned to leverage these national and regional streams of funding.

6. Concluding comments

The Cambridge Technopole has developed over the last 40 years to become one of the most significant areas of innovation activity in Europe. However, there are a number of issues that need to be addressed if the Technopole is to build upon – or even maintain – its success. These issues include the following:

- **Understanding and enhancing core strengths:** Organisations within the Cambridge Technopole have developed significant capability around fundamental and applied research, product development, support for early stage commercialisation. However, the specific technologies and industry sectors in which the Technopole has strengths are not fixed. There needs to be on-going monitoring of the emerging technologies and sectors to ensure support is appropriately targeted. All this needs to be done as part of a more holistic monitoring of the performance of the Technopole. The recently published Greater Cambridge Annual Profile is helping to address this gap.
- **Building scale:** On certain measures, the Cambridge Technopole is relatively small when compared to the main global clusters. One way of building scale is to recognise the Technopole’s core strengths and to support value creation from these strengths by partnering with other regions that have the complementary assets the Technopole lacks. The formation of the Greater South East ‘Supercluster’ may be one way of achieving this.
- **Strengthening linkages internally and externally:** The numerous networks within the Technopole provide a very effective mechanism for ensuring the flow of information between different stakeholder groups and individuals. The Technopole has been less successful at building international links that extend these networks in a manner that delivers value to the Technopole. However, the example of the 2007 ‘Silicon Valley Comes to Cambridge’ programme illustrates how value-adding international links can be developed for the benefit of the Technopole. Also, the provision of dedicated resource to support international activities is one way in which the Technopole is addressing this weakness.

32 www.berr.gov.uk/innovation/technologystrategyboard/

Appendix: Selected milestones in the evolution of the Cambridge Technopole

- 1209: Scholars leave Oxford to seek refuge in Cambridge – leads to formation of University of Cambridge.
- 1534: Cambridge University Press established.
- 1881: Horace Darwin establishes 'Cambridge Instruments' (now part of Leica).
- 1960: Cambridge Consultants formed "to put the brains of Cambridge University at the disposal of the problems of British industry".
- 1969: Mott Report published with recommendation for an expansion of 'science-based industry' in Cambridge³³.
- 1970: Inspired by Mott Report, Trinity College establishes Cambridge Science Park. University sets up Wolfson Cambridge Industrial Liaison Unit to support technology transfer.
- 1970s: Acorn Computers and Sinclair established in Cambridge.
- 1978: Barclays Bank begins actively supporting new technology ventures.
- 1985: 'Cambridge Phenomenon' report published by SQW which highlights growth of high-technology business activities in Cambridge.
- 1987: St. John's Innovation Centre established. University publishes its first IP policy for research council funded research.
- 1990: University of Cambridge Judge Institute of Management Studies established.
- 1997: Ionica plc becomes first Cambridge company to have US\$bn valuation. Eastern Region Biotechnology Initiative established. 1st Cambridge Enterprise Conference held.
- 1998: University of Cambridge Institute for Manufacturing established. Cambridge Network formed to provide a voice for the high-technology business community. Greater Cambridge Partnership established.
- 1999: University of Cambridge Entrepreneurship Centre, University Challenge Fund and Cambridge University Entrepreneurs established; University Technology Transfer Office activities enhanced. East of England Development Agency established. Publicly quoted Cambridge companies, including ARM, Autonomy and Virata, reached multiple billion US\$ valuations.
- 2000: Bursting of dot com bubble leads to slow down in Cambridge economy. Cambridge MIT Institute established in Cambridge with £65m of Government funds to promote entrepreneurship, productivity and competitiveness. Cambridge recognised by the European Commission as being a "region of excellence for the support of innovative start-ups". Life science sector continues to grow.
- 2001: University revises its IP policy for externally-funded research. 'Cambridge Angels' group formed.
- 2004: 2005: IPOs of CSR, CDT, Bango and Amino Communications boosts investor confidence. M&A activity grows. East of England Science and Industry Council (SIC) established. Library House reports Technopole companies secured more than 25 per cent of the UK's venture capital investments and more than 8 per cent of the European total by value.
- 2005: Comprehensive new IP policy adopted by University. East of England Innovation Relay Centre ranked #1 in Europe.
- 2006: GCP establishes International Relations Manager to support international links. Library House reports Technopole growth has 'stalled'. Cambridge Enterprise Limited formed as a wholly owned subsidiary of the University of Cambridge to commercialise technology arising from the University's departments
- 2007: Plastic Logic receives largest single venture capital investment into a European technology-based start-up. 8th Cambridge Enterprise Conference held. St John's Innovation Centre celebrates 20th anniversary.

33 www.iankitching.me.uk/history/cam/phenomenon.html

Notes:



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